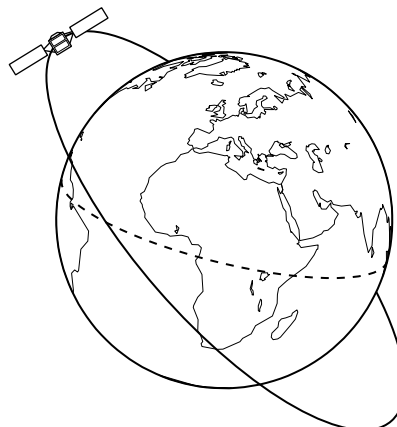
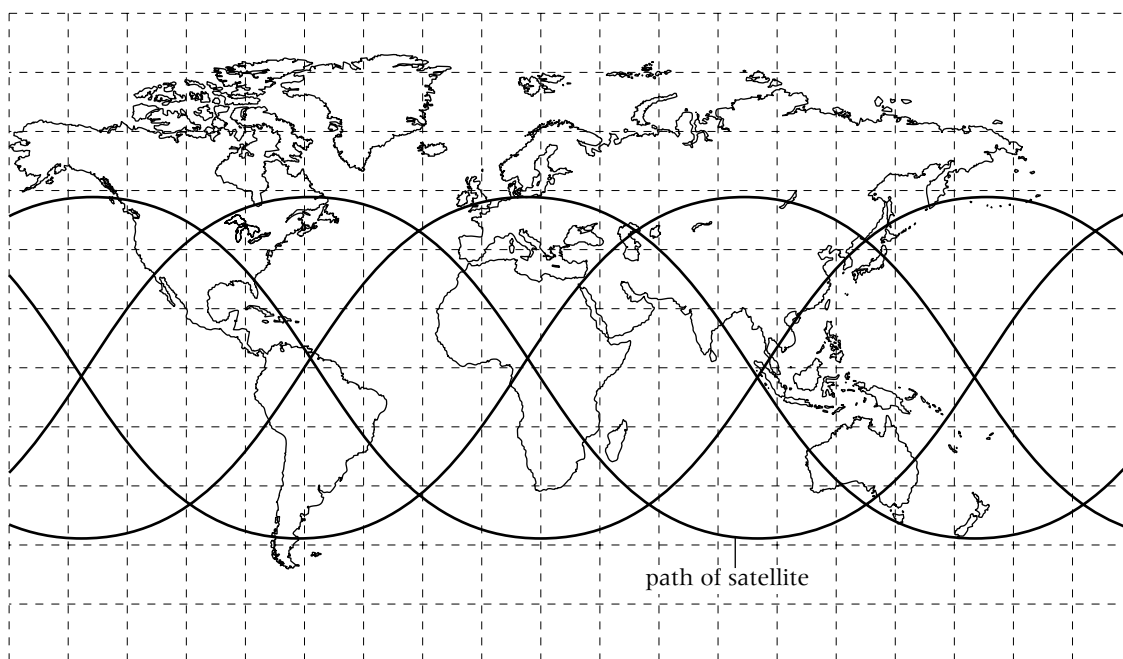


A satellite needs to be moving at a certain speed to stay in its orbit. If it is going too fast it will fly off into space. If it is going too slowly it will fall to Earth. The force of gravity is greatest close to a planet, so satellites that are in low orbits need to move faster than satellites in high orbits. Closer satellites also do not have as far to go, so the time they take to complete one orbit is much shorter than for satellites orbiting further out.



A satellite in a low orbit will take only a few hours to orbit the Earth. If its orbit is tilted relative to the Equator, it will move over different parts of the Earth.

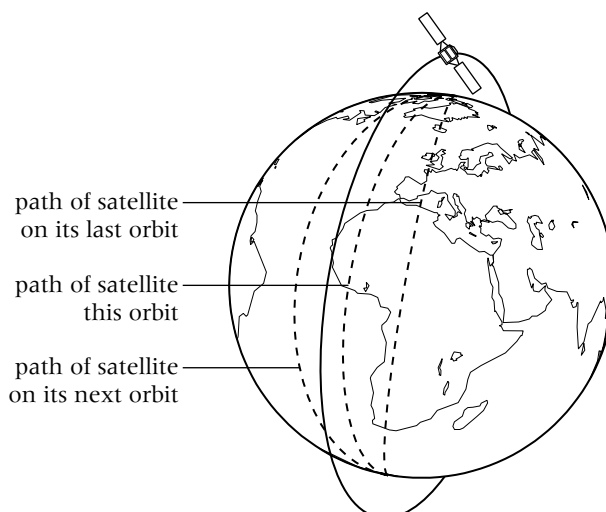
When the satellite reaches this point on its next orbit, the Earth will have spun round and a different part of the Earth will be under it.



The satellite flies over different parts of the Earth on each orbit.

If the satellite is in an orbit that takes it over the North and South Poles, it will eventually cover all parts of the Earth as the Earth spins beneath it. This kind of orbit is called a **polar orbit**.

Some satellites are far enough from the Earth to take exactly 24 hours to complete one orbit. This means that these satellites will stay over the same place on the Earth all the time. This kind of orbit is called a **geostationary orbit**. Satellites in geostationary orbits are usually over the equator.



A satellite in polar orbit.

- 1 Look at the path of the satellite in the diagram on the first page.
 - a Explain why the satellite travels over different parts of the Earth on each orbit.
 - b What would happen to the path of the satellite if its orbit was tilted more?
- 2 The list below shows some different uses for satellites. For each use, say which type of orbit would be best, and explain why.
 - a investigating the ozone holes over the Arctic and Antarctic
 - b transmitting satellite TV pictures
 - c investigating sea temperatures in the world's oceans
 - d making maps of Africa and Asia
 - e helping to make weather forecasts for Europe

S knowledge